

PREVENTIVE SERVICES IN THE CLINICAL SETTING

**What Works and
What It Costs**



U.S. Department of Health and Human Services



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What Works and What It Costs

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FOREWORD

In the past two decades, the capability of the medical care system to diagnose, treat, and palliate illness has been pushed forward rapidly. New tests, procedures, and medications have allowed dramatic recoveries. Our life expectancy at birth as a population has continued to increase. Yet wide discrepancies exist among Americans; less advantaged members of our society experience decreased survival at all stages of life. Moreover, death occurs at the end of a health continuum, a continuum often characterized by the occurrence of preventable and unnecessary illnesses. For low-income populations all along the way are instances of premature morbidity, increased risk exposure, inadequate societal health protection, and lack of access to basic primary and preventive health services.

To the extent that these differences in the health status of vulnerable populations are attributable to lack of access to basic medical services, it is important that preventive services of known effectiveness in forestalling or preventing disability and death be incorporated into the basic benefits available to all Americans. It is equally important that all insured services be delivered in a cost-efficient manner. At a time of increased attention to reform of the Nation's health care system, it is the goal of the U.S. Public Health Service (PHS) to identify

effective and appropriate preventive services and remove barriers to delivery of those services.

Over the last decade, the PHS has sponsored the work of the U.S. Preventive Services Task Force (USPSTF) in order to enhance understanding about preventive services of proven effectiveness. Following the 1989 release of the USPSTF report, *Guide to Clinical Preventive Services*, the National Coordinating Committee on Clinical Preventive Services (NCCCPS) was formed to address issues involved in the delivery of the recommended services. The NCCCPS comprises national provider, financing, and research organizations with a significant interest in clinical preventive services. Key issues for this group have included what services to provide, how to package them, and what their cost would be.

This monograph reports a series of presentations and discussions sponsored by the Committee and summarized at its December 1992 meeting. It is the hope of the PHS that this report will make a timely contribution to the current health care reform debate and will convey a sense of what might be achieved for the health of Americans through the judicious use of clinical preventive services.

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EXECUTIVE SUMMARY

This monograph describes a core set of clinical preventive services—immunization, screening, and education—to be included in insurance benefits for a well population of routine risk. The services are based on recommendations of the U.S. Preventive Services Task Force, a non-Federal expert panel convened by the U.S. Public Health Service that has met since 1984 and has applied an evidence-based methodology to the review of the scientific literature on clinical preventive services. This review process has produced recommendations supporting the delivery of selected services for which sound evidence of clinical effectiveness exists. The services supported by a strong scientific base are presented in Part II of this monograph, together with summary justifications for their inclusion. Other effective services appropriate to high-risk populations are referenced in this report.

The delivery of clinical preventive services in a bundled fashion, rather than as separate items involving multiple examiners and visits, allows for cost efficiencies. In Part III, estimates of charges for packages of age- and gender-specific periodic health examinations, prepared by the Actuarial Research Corporation, are presented. Charge information furnished by self-report of primary care providers to the American Medical Association is used to estimate provider visit charges. Information gathered from private and public insurers is used to calculate charges for ancillary services.

Estimated 1992 provider payments for adding the recommended preventive services package to private health insurance programs, assuming 100 percent participation, average \$62 per year for children, \$84 per year for adult females, and

\$52 per year for adult males. The lifetime averages are \$78 per year for females and \$55 per year for males in 1992 dollars. The monthly costs of provider payment under private insurance for the benefit package outlined in this report are \$14.67 per family and \$5.39 per person with single coverage. Additional costs to Medicare, which already covers some preventive services, would be \$71 per year per female beneficiary and \$71 per year per male beneficiary, or \$5.42 per month per Medicare beneficiary.

Under projections of actual participation levels drawn from the literature, with assumptions of no co-payments or deductibles assessed for clinical preventive services, premium charges for these services range from \$11.66 to \$15.98 per month for family coverage and from \$3.48 to \$4.77 per month for single coverage. Even if no insurers currently covered any clinical preventive services, these numbers still would add less than 3 percent to current premiums. This situation is not the case, however, since these services already are included in 95 percent of health maintenance organization coverage, and preferred provider organizations and indemnity plans cover a range of 30 to 58 percent of the services.

Issues that bear on the costs of fully insuring clinical preventive services are discussed in Part IV. They include the role of cost-sharing and deductibles; receipt of these services in nontraditional settings; anticipated system efficiencies and economies of scale associated with health care reform; and projected increases in reimbursement for cognitive services delivered by generalists.

I. INTRODUCTION

Clinical Preventive Services

Clinical preventive services include immunizations (e.g., influenza vaccination), screening tests (e.g., Papanicolaou testing or Pap smears), and counseling interventions (e.g., smoking cessation advice). Achieving access to clinical preventive services for all Americans by the year 2000 is a cornerstone of the Nation's disease prevention and health promotion objectives.¹ Accomplishment of this goal is fundamental to increasing the quantity of healthy life for the populace overall and for eliminating the disparities in health status that exist among different groups in society.

Many factors are involved in the successful delivery of preventive services to a population. From the perspective of the provider, services must be regarded as effective, practical to incorporate into clinical activities, and reimbursable. From the perspective of the recipient, services must be seen as valuable, acceptable, and affordable. From the perspective of the payer, services must be regarded as cost-effective and estimable.

Insurance

Although insurance coverage is insufficient to guarantee receipt of clinical preventive services, coverage appears to be a necessary condition for widening their use. The RAND Health Insurance Experiment found that enrollees who were required to share health insurance costs, compared with those who received free care, made significantly less use of preventive services, including timely immunizations, Pap smears, and mammography.² Reports from two national samples, the National Health Interview Survey³ and the Access to Care Survey,⁴ strongly link increased use of preventive services with insurance coverage.

Current insurance coverage of clinical preventive services is inadequate. In the private sector, 60 percent of Americans are covered by employer-sponsored group health insurance plans.⁵

A 1990 survey of employer health plans conducted by the Health Insurance Association of America found that only 39 percent of enrollees in conventional indemnity plans and 58 percent of those in preferred provider organizations (PPOs) were covered for well child care.⁶ While 97 percent of persons in health maintenance organizations (HMOs) had benefits that covered these services, only 15 percent of the U.S. population is enrolled in HMOs.⁷ Routine adult examinations were covered for 30 percent of those in indemnity plans, 49 percent in PPOs, and 95 percent in HMO populations. Certain preventive diagnostic procedures, such as mammograms, Pap smears, and childhood immunizations, had higher levels of coverage.⁶

In the public sector, Medicaid-eligible persons aged 21 and under are covered through the Early Periodic Screening, Diagnosis, and Treatment (EPSDT) Program. While a full set of preventive services is covered for children living below a range of 133 to 185 percent of poverty level, one study found that only 23.7 percent of Medicaid-enrolled children received any preventive care under EPSDT in California.⁸ Federal mandate requires that certain basic health care services be offered by States to all categorically needy Medicaid enrollees, but adult preventive services are an optional Medicaid benefit that only 19 States have chosen to cover. For older and disabled Americans, Medicare currently insures a small number of clinical preventive services, including pneumococcal vaccination, cervical cancer screening, mammography, and hepatitis B vaccination for at-risk individuals.

Inclusion of clinical preventive services in a basic benefits package will be an important mechanism for promoting their use. The intense pressure on health care dollars under health care reform dictates that the services chosen for coverage be of demonstrated effectiveness in reducing morbidity and mortality from the targeted condition.

Additionally, services should be delivered in a cost-efficient manner that is structured to avoid extraneous and inflationary visits.

U.S. Preventive Services Task Force

In developing the *Guide to Clinical Preventive Services*, the U.S. Preventive Services Task Force (USPSTF) used a rigorous, evidence-based methodology to provide a carefully documented review of the effectiveness of clinical preventive services.⁹ Its review permits the recommendation of selected preventive services for coverage in a basic benefits package. The grouping of preventive services into a periodic health examination (PHE) that includes risk assessment, physical examination, immunizations, laboratory tests, x-rays, and risk-specific counseling will allow delivery of these services at rational intervals and at the lowest cost. Inclusion of risk assessment and health advice

within the traditional context of clinical medicine allows for lower marginal costs for these activities. At the same time, the clinical setting furnishes an authoritative forum to provide health promotion information.

The core group of services in this package is culled from the science base reviewed by the USPSTF. It represents a minimum level of benefits that should be provided to a well population. Other effective preventive services for persons with additional risk factors have been identified by the USPSTF. These services, directed at small subgroups of the population, are not discussed in this report.

These recommendations are not static. The USPSTF continues to review new evidence that has bearing on its existing recommendations, as well as on other conditions not covered in its original evaluations.

II. PACKAGE AND SUMMARY OF EVIDENCE

Preventive Services Package

Summarized in Table 1 are the components of the package of preventive services presented to the National Coordinating Committee on Clinical Preventive Services (NCCCPS). The recommended clinical preventive services include periodic health examinations (PHEs) by physicians, immunizations, laboratory tests, and other screening tests. *All* periodic examinations include a history, a physical examination (including measurement of blood pressure, height, and weight), and risk assessment/health guidance. Health guidance will vary by gender, age, and risk factors. For children up to 12 years of age, health guidance will include diet, injury prevention, oral health, and other primary preventive measures. For adolescents and adults, counseling categories include diet and exercise; use of alcohol, tobacco, and other drugs; sexual practices (including contraception); injury prevention; and oral health. The frequency of visits and type of services vary with age group and gender. This set of services is for asymptomatic individuals without special risk factors. Additional services would be appropriate for those whose medical history or health-related behaviors place them at higher risk.

Justifications

Patient Education and Counseling.

Empirical research and clinical experience have yielded certain principles that clinicians can use to induce behavioral change among patients. Behavioral changes can have significant impact on the health of individuals. Age- and gender-appropriate risk assessment and counseling are an integral part of the PHE. This exchange of information between health care professional and patient fosters the development of a therapeutic alliance that allows individuals to understand the relationship between behavior and health; identify barriers to behavioral change; select risk factors for change; and make a commitment to modify health risks. The preventive services proposed for periodic visits

include a routine screening for lifestyle risk factors, discussion of relevant issues, and referral for followup if necessary.

A meta-analysis of 54 studies evaluating patient education and counseling for smoking cessation, nutrition, weight loss/management, injury prevention, and other health-related behaviors found that such interventions significantly affected behavioral changes across the experimental groups.¹⁰ The INSURE project (Industry-wide Network for Social Urban and Rural Efforts) evaluated changes in patients' health-risk behavior 1 year after preventive intervention by primary care physicians.¹¹ The trial used pre- and post-intervention surveys to measure changes in behavioral risks and found that study patients were significantly more likely than controls to report positive changes in using safety belts, losing weight, decreasing alcohol intake, and performing monthly breast self-examination (women). A trend toward increased success with smoking cessation was observed in the study group, but it was not statistically significant.

Childhood Immunizations. Routine immunization in early childhood against seven infectious diseases—diphtheria, pertussis, tetanus, polio, measles, mumps, and rubella—is a well-accepted cornerstone of preventive care. Childhood vaccines are one of the great success stories of public health: millions of cases of childhood diseases and thousands of deaths have been averted since immunizations became common. They are recommended by all public health authorities and by the U.S. Preventive Services Task Force (USPSTF). Three newer vaccines—a conjugate vaccine given in the first year of life against *Haemophilus influenzae* type b, a reduced-dose hepatitis B vaccine for infants, and an acellular pertussis component of the DTP vaccine for doses four and five—were introduced after the USPSTF published its recommendations. These three immunizations now are recommended by all leading authorities, however, and are included in the package.

TABLE 1
Preventive Services Package

Age	Immunizations	Tests	Clinician Visits ⁺⁺⁺
0–5	5 DTP, 4 OPV, 3–4 Hib, 2 MMR, 3 HBV	1 Hematocrit, 1 Urinalysis, 2 Lead*	9
6–19	1 Td	Pap/pelvic** every 3 years*** +	5
20–39	1 Td every 10 years	Cholesterol every 5 years Pap/pelvic** every 3 years*** +	Every 3 years
40–49	1 Td every 10 years	Cholesterol every 5 years Pap/pelvic** every 3 years*** +	Every 2 years
50–64	1 Td every 10 years	Cholesterol every 5 years Pap/pelvic and mammogram ⁺⁺ every 2 years	Every 2 years
65 +	1 Td every 10 years Pneumococcal - once Annual influenza	Cholesterol every 5 years Mammogram ⁺⁺ every 2 years	Annually

Key

- * Children at high risk for lead exposure
- ** Females, once sexually active
- *** Once three annual negative smears obtained
- + Females of childbearing age with more than one sexual partner should have an annual Pap smear and screening for chlamydia and gonorrhea
- ++ Females only
- +++ All visits include risk assessment and health advice/counseling

- DTP: Diphtheria, tetanus, pertussis
- OPV: Oral polio vaccine
- Hib: *Haemophilus influenzae* type b
- HBV: Hepatitis B
- MMR: Measles, mumps, rubella
- Td: Tetanus diphtheria toxoid

Lead. The toxicity of lead, especially in children, has been well documented. As scientific evidence has accumulated, blood levels of lead formerly considered safe for children have been found to be hazardous.¹² Recent data indicate that levels as low as 10 µg/mL may be associated with measurable adverse effects.^{13,14} Both the USPSTF and the Centers for Disease Control and Prevention (CDC) have recommended routine lead screening for high-risk children. Current estimates are that 17 percent of American children have blood levels of lead exceeding safe levels.¹⁵ New CDC recommendations are to screen all children for lead toxicity at 12 and 24 months of age.¹² The USPSTF is in the process of reviewing the current science base to evaluate the evidence for universal screening.

Anemia. Iron deficiency anemia is common in the United States, affecting up to 5 percent of

infants.¹⁶ Iron-deficient infants score poorly on tests of mental and psychomotor development.¹⁷ Controversy exists on the efficacy of early intervention, although some studies have shown improvement of developmental scores of iron-deficient infants after correction of anemia by iron supplementation.¹⁸ The USPSTF and others recommend hemoglobin/hematocrit testing in the first year of life, and one test is included in the package recommended here.

Hypertension. There is a direct relationship between the magnitude of blood pressure elevation and the benefit of lowering pressure. In persons with malignant hypertension, the benefits of intervention are most dramatic; treatment increases 5-year survival from near 0 to 75 percent.¹⁹ Persons with stage 1 hypertension (systolic blood pressure of 140 to 159 mm Hg and diastolic of 90 to 99 mm Hg) also benefit from treatment. The Hypertension

Detection and Follow-Up Program, a randomized controlled trial involving some 11,000 people with hypertension, found a statistically significant 20 percent decrease in 5-year all-cause mortality for people with hypertension with a diastolic blood pressure of 90 to 104 mm Hg who received a standardized treatment regimen for their hypertension compared with the control group referred to their regular physicians for treatment.²⁰ Similar results have been reported in other studies.^{21,22} Reductions in morbidity and mortality also have been demonstrated when systolic pressure is lowered. The Systolic Hypertension in the Elderly Study showed a 33 percent reduction in strokes and a 27 percent reduction in coronary heart disease among the group receiving antihypertensive therapy compared with the placebo group.²³ Improved treatment of high blood pressure has been cited as contributing to the greater than 57 percent reduction in age-adjusted stroke mortality and the 50 percent reduction in coronary heart disease mortality observed since 1971.²⁴

Hypercholesterolemia. Early detection of high blood cholesterol in asymptomatic persons allows identification of an important modifiable risk factor for coronary heart disease (CHD). The Framingham Study observed the occurrence of CHD in men over a 30-year period and found that CHD risk increases in a continuous and graded fashion beginning with serum cholesterol levels as low as 180 mg/dL. Overall, CHD death increased by 9 percent for each 10 mg/dL.²⁵ Randomized controlled trials involving middle-aged men with high cholesterol have shown that cholesterol-lowering drugs can reduce the incidence of CHD in asymptomatic persons.^{26,27,28}

Breast Cancer. Breast cancer accounts for 32 percent of all newly diagnosed cancers in women and 18 percent of female cancer deaths.²⁹ The annual incidence of breast cancer increases rapidly with age.³⁰ The risk for women with a family history of premenopausally diagnosed breast cancer in a first-degree relative is about two to three times that of the average woman of the same age.³¹ Nearly 10 percent of American women will develop breast cancer during their lives. Clinical breast examination is an effective, inexpensive screening test for breast cancer. A 1985 study reported that physicians were able to detect 87 percent of all lumps 1 centimeter in diameter.³² The USPSTF has recommended regular clinical breast

examinations for women starting at age 40. Regular use of screening mammography has been found to reduce breast cancer mortality in women aged 50 and over.^{33,34,35} For the special category of women at high risk due to family history in first-degree relatives, it may be prudent to begin regular clinical breast examination and mammography earlier.

Cervical Cancer. The dramatic reductions seen in invasive cervical cancer and cervical cancer mortality are almost entirely attributable to use of the Pap test. A major study of eight cervical cancer screening programs in Europe and Canada involving over 1.8 million women found that the cumulative incidence of invasive cervical cancer was reduced more than 90 percent when Pap tests were done every 3 years.³⁶

Chlamydial Infection. An estimated 3 to 4 million persons acquire chlamydial infections each year in this country.³⁷ Chlamydial infections are responsible for 25 to 50 percent of the 1 million cases of pelvic inflammatory disease (PID) reported annually; incidence of infection is highest in persons under age 25 with more than one sexual partner.³⁸ PID is a significant cause of infertility and ectopic pregnancy in American women.³⁹ Each year more than 155,000 infants are born to *Chlamydia*-infected mothers. Neonatal infection can result in ophthalmia neonatorum and pneumonia. Urethral and endocervical cultures have been estimated to have a sensitivity of 80 to 90 percent and a specificity of 100 percent.^{40,41,42} Early detection of chlamydial infection in asymptomatic persons permits initiation of antibiotic therapy and prevention of sequelae.

Gonorrhea Infection. An estimated 1.2 million persons acquire gonococcal infections each year in the United States.⁴³ Gonorrhea is associated with considerable morbidity, producing painful pelvic inflammatory disease in women and putting them at increased risk for infertility and ectopic pregnancy. Pregnant women with active gonococcal infection are at increased risk for obstetrical complications and can give birth to infants with gonococcal conjunctivitis. Incidence of gonorrhea is highest in young adults under age 25 and persons with multiple sexual contacts. The highest age-specific rates for women are among 15- to 19-year-old teenagers. Direct culture is highly sensitive, specific, and relatively low in

cost.³⁶ Early detection of infection allows antibiotic therapy prior to complications and permits identification of sexual contacts at risk for infection.

Urinalysis. In children, detection of bacteriuria can lead to the identification of correctable abnormalities of the urinary tract and the prevention of renal scarring, obstructive atrophy, hypertension, and renal insufficiency. Most of these complications are thought to occur before children reach school age; therefore, screening would appear to be most effective in the preschool years.⁹ Dipstick screening tests for bacteriuria have sensitivities ranging from 72 to 97 percent and specificities from 64 to 82 percent.^{44,45} Although the effectiveness of early treatment of asymptomatic bacteriuria in children has not been well studied, in adult women antibiotic treatment has been shown to reduce the incidence of subsequent bacteriuria.^{46,47}

Pneumococcal Immunization. Pneumococcal disease accounts for about 40,000 deaths each year,⁴⁸ and pneumococcal pneumonia is fatal in 5 percent of patients.⁴⁹ The pneumococcal vaccine has been estimated to have an efficacy of 60 to 70 percent in immunocompetent recipients.^{50,51} It should be administered once to all persons aged 65 and older, as well as to younger persons with specific chronic illnesses that make them at risk for complications of pneumococcal pneumonia.

Influenza Immunization. Influenza is responsible for significant morbidity and mortality, particularly among older persons and persons with underlying medical disorders. Eighty to ninety percent of all reported deaths from influenza occur among persons aged 65 and older.⁵² Influenza vaccine containing antigens identical or similar to currently circulating influenza A and B viruses has been shown in controlled studies to be 70 to 80 percent effective.⁵³ Retrospective studies support its efficacy in elderly high-risk populations.^{54,55}

Tetanus/Diphtheria Immunization. Largely as a result of routine immunization, tetanus and diphtheria have become uncommon diseases in the United States. Although uncommon, tetanus remains a serious infection, with death occurring in 26 to 31 percent of cases.⁵⁶ The case-fatality ratio is greater than 30 percent for

persons aged 50 and older, who account for more than two-thirds of all cases. Tetanus-diphtheria toxoid (Td) is highly effective in producing protective antibody titers but requires a primary series of three doses, followed by adult booster doses every 10 years.⁵⁷

Screening Tests Currently Under Review

Sigmoidoscopy/Fecal Occult Blood.

Colorectal cancer is the second most common cause of cancer deaths in the United States; it will cause an estimated 57,000 deaths in 1993.²⁹ The USPSTF does not recommend routine screening for colorectal cancer by fecal occult blood testing, primarily because of the poor predictive value of a positive stool guaiac test. However, a recently reported prospective randomized trial of occult blood testing has shown benefit in protecting against death from colorectal cancer.⁵⁸ Two large screening programs have reported that persons receiving periodic rigid sigmoidoscopic examinations had less advanced disease and better survival for colon cancer than was typical of the general population.^{59,60} Although the USPSTF recommends routine screening sigmoidoscopy only for persons in high-risk groups, ongoing studies of flexible sigmoidoscopy screening and a recent case-control study of colorectal cancer screening⁶¹ may provide the evidence needed to recommend sigmoidoscopic screening on a regular basis. Thus although routine screening for colorectal cancer is not currently included in this package, it may be added at a later date.

Prostatic Specific Antigen/Transrectal Ultrasound.

Prostate cancer is the most common cancer among men, and it is the second most common cause of male cancer deaths. An estimated 165,000 new prostate cancer cases will occur in 1993.²⁹ Currently there is insufficient evidence that early detection and treatment of prostate cancer improves survival. The National Cancer Institute has begun a multi-center randomized trial of the value of these screening tests. Results will not be available until the end of the decade. While screening tests for prostatic cancer have attracted much attention, both in the press as well as within insurance reform proposals, there is at this time inadequate evidence to recommend their inclusion in a standard benefits package.

III. COSTS OF INSURING RECOMMENDED PREVENTIVE SERVICES

This section summarizes a report to the U.S. Public Health Service (PHS) conducted by the Actuarial Research Corporation (ARC) in November 1992. It provides estimates of the costs of provider payments for recommended preventive services under private health insurance plans and the Medicare program and projects premium levels for insurers not currently covering these services. Additional premiums for Medicare beneficiaries are projected also.

Summary of Findings

Estimated 1992 provider payments for adding the recommended preventive services package to private health insurance programs, assuming 100 percent participation, average \$62 per year for children, \$84 per year for adult females, and \$52 per year for adult males. The lifetime average is \$78 per year for females and \$55 per year for males in 1992 dollars. The monthly costs of provider payment under private insurance for the benefit package outlined in this report are \$14.67 per family and \$5.39 per person with single coverage. Additional costs to Medicare, which already covers some preventive services, would be \$71 per year per female beneficiary and \$71 per year per male beneficiary, or \$5.42 per month per Medicare beneficiary.

Insurance premiums are derived from projections of participation level for a particular benefit. The 1992 premiums for adding the preventive services package to private health insurance programs, assuming average participation rates based on the literature, range from \$11.66 to \$15.98 per month for family coverage and from \$3.48 to \$4.77 per month for single coverage. Universal lead screening for 1- and 2-year-olds would add an additional \$.34 to a family premium. For each Medicare beneficiary, estimated extra premium costs are \$3.82 per month to provide the additional preventive services.

Premiums will vary according to the type of insurance plan and will decrease with increasing size of the group. For the average employer's health plan, including preventive care would increase total premiums by 3 percent or less. All premium estimates assume no cost-sharing for participants.

Provider Payments

Provider payments are the insurance reimbursements to physicians, other health professionals, drug manufacturers, laboratories, and radiology facilities. The American Medical Association (AMA) surveys physicians nationwide on what they charge for periodic or annual examinations.⁶² Table 2 shows the 1992 fees for the periodic examinations by specialty and compares them with office visits. These are average fees from physicians around the country. The average fees for general and family practice physicians are lower than the fees for internists. New patient visit fees for obstetricians/gynecologists are lower than those for internists but higher than for family and general practitioners. The average fee for general and family practice physicians is higher than for pediatricians and obstetricians/gynecologists for a periodic examination but lower for other office visits. The periodic examination fee for general and family practice for adult preventive care and the periodic examination fee for pediatricians for children are used to estimate the average fees likely to be charged for these health examinations. Thus the 1992 fees used for periodic examinations are \$69 for adults and \$47 for children.

Sources of Payment Data

A number of insurance organizations were contacted to obtain average or maximum payment levels for specific preventive services. Ten Blue Cross and Blue Shield plans and three large insurance companies gave payment rates for at least half of the services. Most of the

TABLE 2
Average 1992 Fees for Periodic Examinations

Specialty	Periodic Exam	Established Patient Visit	New Patient Visit
General/Family Practice	\$ 69	\$ 37	\$ 55
Internal Medicine	91	49	117
Obstetrics/Gynecology	64	56	89
Pediatrics	47	44	67

Source: *Physician Marketplace Statistics 1992*, AMA, 1993.

Blue Cross and Blue Shield plans provided the maximum payment levels for the services. One insurance company provided average national payment rates. The other two insurance companies provided maximum payment rates in the area where their main office is located. The average payment levels are preferred because they reflect what is paid by the insurers. However, maximum payment levels (also known as fee schedules or Usual, Customary, and Reasonable [UCR] levels) are more readily available than average payment levels. The maximum payment levels may be only 10 percent to 15 percent higher than the average payment levels for Blue Cross and Blue Shield plans. The maximum payments for the one insurance company providing both types of payment levels for some of the services were 25 to 60 percent higher than the average payments.

The means for provider payments from the 13 insurance organizations are shown in Table 3. These means are based on the unweighted responses for each service. Although responses are from different regions of the country, the means may not be representative of a weighted national average. Also, because most of the insurers gave maximum payment levels, the means may be higher than the average actual payments to providers. No separate Current Procedural Terminology (CPT) code exists for hepatitis B vaccination for infants. The average or maximum payment reported by the insurers was for the adult dose of hepatitis B, which is larger and more expensive than the dose used for infants. The same mean insurance payment for DTP of \$25 was used for the hepatitis B vaccination for infants because the commercial prices for the two were similar (\$9.97 for DTP and \$10.71 for hepatitis B).

Medicare payments for the identified services also are provided in Table 3. For the periodic examination payment, physician visit codes 99204 for new patients and 99214 for established patients are used. They represent the fourth most comprehensive of the five visit codes included on the Medicare fee schedule. Assuming that three visits for an established patient occur for each visit for a new patient, the weighted average is 1.79 relative value units. Applying the 1992 conversion factor of \$30 per relative value unit without geographic adjustments, the 1992 Medicare payment is \$54. Laboratory payments are those from the laboratory fee schedule. Medicare currently covers one-time pneumococcal vaccine, screening mammograms every 2 years, and screening Pap smears every 3 years. Private insurance payments for tetanus and diphtheria and influenza immunizations are used for Medicare.

Table 4 shows average provider payments per year for different age groups. Also shown are average payments by age group assuming provider payments for all services except physician visits are 15 percent lower than the means from the insurers' responses. The payments over an average lifetime from ages 0 to 75 are \$72 to \$78 per year for females and \$52 to \$55 per year for males in 1992 dollars.

Costs for Different Insurance Program Provider Payments, Assuming 100 Percent Participation

Age and sex distributions from the March 1991 Current Population Survey (CPS) were used to calculate the costs of provider payments for

TABLE 3
Reimbursement to Providers
(Fees Paid by Insurance)

Service	CPT Code	Mean 1992 Insurance Company Fees	1992 Medicare Fees
Physician Visit		\$ 69 adults 47 children	\$ 54.00
DPT	90701	25	
MMR	90707	44	
OPV	90712	22	
Td	90718	14	
Influenza	90724	13	
HBV	90731	54	
Pneumococcal	90732	20	
Hib	90737	27	
Mammogram	76092	90	56.76
Urinalysis	81000	14	4.81
Cholesterol	82465	17	6.61
Lead, blood	83655	46	17.75
Hematocrit	85014	12	3.60
Gonorrhea	87072	27	11.80
Chlamydia	87110	47	29.90
Pap smear	88150	21	7.89
Audiogram	92552	30	

different insurance programs. The CPS includes persons with employer-sponsored health insurance and Medicare. Provider payments are combined with the age distributions to calculate total costs and average costs. Employer and insurance groups with different age distributions may have higher or lower costs.

Average monthly costs per family, per child, for single adult coverage, and per Medicare beneficiary are included in Table 5. Insurance families comprise an average of 2.1 adults over the age of 19 and 1.1 children. Total average monthly benefit for families is calculated by adding the costs of adults and children with family coverage and dividing by the number of families. The total monthly benefit for persons with single coverage is calculated as a unisex rate by adding the costs for females and males and dividing by the total number of persons with single coverage. In the calculation of

additional laboratory requirements, 24 percent of all females with single coverage are estimated to have more than one sexual partner. Separate rates are calculated for women/men by taking the costs for all female/male adults and dividing by the number with single coverage.

Medicare monthly costs are also shown in Table 5, under the assumption of 100 percent participation. The Medicare total is the summed cost of all of the recommended preventive services for Medicare beneficiaries whether or not they are covered currently by Medicare. The assumption in this report is that no physician visits associated with the receipt of clinical preventive services are covered currently. Estimated monthly incremental costs required to cover all Medicare beneficiaries for the full complement of recommended services is \$6.89.

TABLE 4
1992 Costs for All Recommended Preventive Services in Dollars
(Payments to Providers)

	Immunizations Per Year	Tests Per Year	Physician Visits Per Year	Total Per Year Using Maximum Insurance Fees	Total Per Year Using Lower Insurance Fees
I. Children Under Private Insurance					
Ages 0-5	77	20	71	\$167	\$152
Ages 6-19	1	0	17	18	18
Ages 0-19	24	6	33	62	58
II. Female Adults Under Private Insurance					
Ages 20-39	1	14	31	\$46	\$44
Ages 40-64	1	43	36	80	73
Ages 65-75	17	76	69	162	148
Total 20-75	4	39	41	84	78
III. Male Adults Under Private Insurance					
Ages 20-39	1	3	24	\$29	\$28
Ages 40-64	1	3	36	40	40
Ages 65-75	17	35	69	121	113
Total 20-75	4	10	38	52	50
IV. Private Insurance Lifetime Total					
Females 0-75	9	30	39	\$78	\$72
Males 0-75	9	9	37	55	52
V. Medicare Total					
Females 65-75	17	28	54	\$99	
Males 65-75	17	2	54	451	
VI. Medicare (Costs in Addition to Current Coverage)					
Females 65-75	16	2	54	\$71	
Males 65-75	16	2	54	71	

Participation Levels: Available Data

Even if insurance is provided for preventive services, not everyone will receive all of the recommended services. Participation rates are estimated based on utilization data on preventive services from population surveys and special studies such as the INSURE project¹¹ and the RAND Health Insurance Experiment.²

While the percentage of school-age children who were fully immunized by age 2 is reported as below 56 percent,⁶³ in 1990, 97 percent of school-aged children were immunized for polio and DTP and 98 percent were immunized for measles, mumps, and rubella.⁶⁴ Few data exist on the newer immunizations, i.e., hepatitis B and *Haemophilus influenzae* type b conjugate (Hib) for infants.

TABLE 5
1992 Monthly Costs of Preventive Services in Dollars
(Provider Payments Only; Assuming 100 Percent Participation)

	Immunizations	Laboratory and Other Tests	Physician Visits	Total Costs
I. Private Insurance				
A. Family Total	\$ 2.77	\$ 2.71	\$ 9.20	\$ 4.68
Children	2.27	0.11	3.05	5.43
Adults	0.50	2.60	6.15	9.25
Female Adults	0.24	2.31	3.16	5.71
Male Adults	0.26	0.29	2.99	3.54
B. Single Total	0.24	1.93	3.22	5.39
Females	0.30	3.69	3.98	7.97
Males	0.19	0.31	2.52	3.02
II. Medicare Total	1.16	1.51	4.22	6.89
Females	1.19	2.41	4.30	7.90
Males	1.12	0.12	4.14	5.38
III. Medicare (Costs in Addition to Current Coverage)				
	1.08	0.13	4.22	5.42
Females	1.11	0.14	4.30	5.55
Males	1.04	0.12	4.14	5.30

The National Health Interview Survey (NHIS) reported that 69 percent of children between the ages of 5 and 16 years had a physical examination once at ages 5 and 6 and once every 2 years from ages 7 to 16.⁶⁵ The percentage was lower for children with family incomes below the poverty level (62 percent) but higher for children with Medicaid (83 percent). The 1991 NHIS supplement on health promotion and disease prevention shows a steadily increasing pattern of routine checkups for men beginning at age 20. During the decade between 20 and 29, 65 percent of the population reported a checkup within the past 3 years, while in the over 65 age group, 67 percent of men reported a routine checkup within the previous year, and over 90 percent visited within the previous 2 years. Women's visit rates for routine checkups are higher in the earlier decades, approaching 85 percent every 3 years from 20 to 39, and then falling off in later decades.⁶⁶

Immunizations and other preventive services for adults are less widely utilized. According to the NHIS,⁶⁴ 69 percent of men and 80 percent of women had their blood pressure measured in

1990. About 41 percent of persons 65 years of age and over were immunized for influenza, and 14 percent were immunized with the pneumococcal vaccine in 1989.⁶⁷ The percentage of elderly persons immunized may have increased with Medicare's recent coverage of the pneumococcal vaccine.

The Centers for Disease Control and Prevention publishes data from its Behavioral Risk Factor Surveillance System. In 1989, 55 percent of women aged 40 and over had a mammogram in the previous 2 years.⁶⁸ The figures are as high as 64 percent for women aged 50 to 59 but lower for women aged 70 and over (45 percent). The 1990 NHIS reported that 81 percent of women aged 18 and over had received a Pap smear within the past 3 years.⁶⁴

Self-reporting of preventive services may be overstated. In a study of use of mammography, no documentation could be found for 7 percent of the women who reported receipt of a mammogram.⁶⁹ About 27 percent of the women incorrectly thought they had had a mammogram within the last year, but the date of their mammogram was earlier.

In a 1989 study population of 18,053 employees of different companies who volunteered to complete a health profile, 86 percent had received a blood pressure test administered by a health professional within the past year, and 59 percent had a tetanus shot within the last 10 years.⁷⁰ Eighty-one percent of women had a breast examination by a health professional in the last year. This study population was mostly white collar and well educated; thus, they were more likely to be aware of the benefits of prevention than the general population.

The INSURE project was an experimental study of preventive services funded by insurance companies, private foundations, and the Federal Government.^{11,71} Physicians were educated on the importance of preventive care. Their patients were offered preventive services fully paid through INSURE, without any cost sharing. In a report of use of preventive services during March 1982 to September 1983, 38 percent of the 1,633 patients received a physical examination. Participation varied by age: 23 percent of those aged 18 to 24, 26 percent of those aged 25 and older, 46 percent of those aged 40 to 59, and 51 percent of children aged 2 to 5 received a physical examination. The utilization rates also varied significantly at the three study sites.

The RAND Health Insurance Experiment also found that, even with insurance covering all of the costs, preventive services were not used by many of the enrollees.² Only 44 to 60 percent of the infants received recommended vaccines. Very few adults received the tetanus and influenza vaccines. Less than 8 percent of women aged 45 to 65 had a mammogram, and 57 to 66 percent of women aged 17 to 65 had Pap smears.

There are few studies of the number of persons who have more than one sexual partner. The National Opinion Research Center has conducted four annual surveys on this subject and provided data by marital status for 1988.⁷² Only 2 percent of married women and 5 percent of married men reported having more than one sexual partner in the previous year. For single women, the rates were 40 percent for women under 30, 30 percent for women aged 30 to 49, and 12 percent for women aged 50 and over. These percentages are from a general population, not just those with insurance, thus they may be considered high

estimates. These percentages are used to estimate the number of women who have more than one partner and who have single coverage. The costs for females with family coverage are very small (less than 2 percent) compared with total family costs; therefore, they are not included. Fifty percent of females with more than one partner are assumed to receive the recommended services.

Participation Levels Used in Premium Determination

In general, participation levels are found to be lower when based on medical records than when based on self-report. For purposes of premium calculation, estimates are for participation levels that are higher than those from the INSURE and RAND projects but somewhat lower than those reported by population surveys. Participation rates used in this analysis are shown in Table 6.

A participation level of 90 percent is used for all childhood immunizations, which is calculated as a weighted average of 97 percent for the required vaccines and 77 percent for the other vaccines. While a much lower percentage of children receive these immunizations prior to the age of 2, by the time they enter school, nearly universal immunization is accomplished.

For adults, a 50 percent participation level is estimated for immunizations. For services other than immunizations, participation level estimates are aggregated from the existing information on utilization of component aspects of the package of services. The lower participation rates for older women take into account the higher frequency and number of recommended services.

Total Benefits for Preventive Services

Table 7 summarizes the monthly benefit costs for family and single coverage and Medicare for the preventive services package. These benefit costs include only the payments to providers and are calculated using the payment rates per service, the age and sex distributions, and participation rates. Overall monthly benefit costs are then calculated for family and single coverage.

TABLE 6
Participation Rates for
Preventive Services

Age	Rates for Females (%)	Rates for Males (%)
0	80	80
1	70	70
2	70	70
3	70	70
4		
5	90	90
6		
7		
8	60	60
9		
10		
11	60	60
12		
13	60	60
14		
15	60	60
16		
17	60	60
18		
19		
20-24	85	50
25-29	85	50
30-34	85	50
35-39	85	50
40-44	75	60
45-49	75	60
50-54	75	70
55-59	75	70
60-64	75	70
65-69	75	70
70-74	75	70
75-79	75	70
80-84	75	70
85+	75	70

Premiums

This section provides estimates of the premiums insurers would charge for the previously described preventive services package under private health insurance plans and the costs of adding preventive services to the Medicare program. These premiums are calculated from the payment rates, expected participation rates, and insurers' administrative costs.

Payments to providers, the benefit cost, are the major expense of insurance companies. However, other expenses need to be included in the premiums charged to cover preventive services. All health plans, including self-insured plans, process claims and have general administrative expenses. For employers and other organizations that purchase insurance from Blue Cross and Blue Shield plans or insurance companies, additional administrative costs include premium taxes, risk and profit, marketing expenses, and sales commissions.

The largest groups are charged the lowest administrative costs because of economies of scale in claims processing and marketing. Smaller groups are charged more because of higher turnover, risk, and sales commissions. Total administrative costs are estimated at 8 percent of benefit payments to providers for self-insured plans, 8 to 15 percent for groups with more than 25 persons, and 13 to 48 percent for individual or nongroup insurance. These administrative expenses are higher than the average administrative costs of large plans, which can be as low as 3 or 4 percent, because it is more expensive to administer the relatively small claims for physician visits, immunizations, and tests. The administrative costs for Medicare are estimated at 3 percent based on the 1992 *Medicare Trustees Report* for physician and outpatient services.

The estimated 1992 premiums for including preventive services in self-insured plans are shown in Table 8. Self-insured plans would charge about \$11.66 per month for families and \$3.48 per month for single coverage. Preventive care would increase Medicare premiums by \$3.82 per month for each beneficiary. Health plans with 25 or more persons would charge \$11.66 to \$12.42 for families and \$3.48 to \$3.70 for single coverage (not shown in Table 8). For persons purchasing individual insurance policies, premiums would be \$12.20 to \$15.98 for families and \$3.64 to \$4.77 for single coverage.

TABLE 7
1992 Monthly Benefit Costs* of Preventive Services
 (By Different Types of Insurance)

	Immunizations	Laboratory and Other Tests	Physician Visits	Total Costs
I. Private Insurance				
A. Family Total	\$2.27	\$ 2.03	\$ 6.50	\$ 10.80
Children	2.02	0.07	2.16	4.25
Adults	0.25	1.96	4.34	6.55
Female Adults	0.12	1.78	2.49	4.39
Male Adults	0.13	0.17	1.85	2.15
B. Single Total	0.12	1.20	1.91	3.23
Females	0.15	2.31	2.41	4.87
Males	0.10	0.17	1.45	1.72
II. Medicare Total	0.58	1.13	3.08	4.79
Females	0.59	1.81	3.23	5.63
Males 0.56	0.08	2.88	3.52	
III. Medicare (Costs in Addition to Current Coverage)				
Females	0.54	0.09	3.08	3.71
Males 0.52	0.56	0.10	3.23	3.89
	0.08	2.88	3.48	

*Provider payments only at expected participation levels.

TABLE 8
1992 Monthly Premiums* for Preventive Services
 (By Different Types of Insurance)

	Immunizations	Laboratory and Other Tests	Physician Visits	Total Premiums
I. Self-Insured Plans				
Family	\$ 2.45	\$ 2.19	\$ 7.02	\$ 11.66
Single	0.13	1.30	2.06	3.48
II. Total Medicare	0.60	1.16	3.17	4.93
III. Medicare (Costs in Addition to Current Coverage)				
	0.58	0.09	3.17	3.85

*Premiums include provider payments and claims processing.

These additional premiums are relatively low compared with total premiums. In 1991, the average weighted premiums under an employer's plan were \$351 per month for family coverage and \$149 for single coverage.⁷³ If these premiums increased 10 percent per year, the premiums would have been \$386 for family coverage and \$163 for single coverage in 1992. Adding preventive care would increase the average premiums by 3 percent or less for policies that do not include this coverage. Many clinical preventive services already are covered by insurers; therefore, the costs discussed in this report should not necessarily be considered as totally additional to current average premium costs. Also, some preventive services may be paid by insurers in the absence of specific coverage because the preventive care occurs at the same visit as a service for a specific medical condition or the service is coded as if there were a medical diagnosis.

The premiums estimated here are predicated on the use of preventive services at participation levels above what is reported in insurance-based studies of utilization. In the first few years of inclusion of these services in a benefit package, policyholders may not be aware of the coverage, and utilization levels may not be as high as assumed in this report.

Cost Estimates of Other Groups

In parallel with the ARC and PHS staff, six member organizations of the National Coordinating Committee on Clinical Preventive Services (NCCCPS) collected information on the pricing of recommended clinical preventive services for presentation and discussion at the NCCCPS December meeting. Time and resource constraints prohibited random sampling or more extensive and systematic data collection; therefore, convenience samples were used to obtain estimates on the pricing of clinical preventive services. The numbers were not intended to suggest appropriate pricing of services but did serve as a basis for comparison with the ARC report.

While within services there was substantial intragroup variation, the ARC numbers were within 20 percent of the mean in all cases, with the exception of screening mammography. Here the ARC reported charge was \$90, compared with the mean of \$71.33 for the organizations furnishing comparison data. The NCCCPS member organizations that reviewed pricing of services were American Academy of Family Physicians, American Academy of Pediatrics, American Association of Colleges of Nursing, Society of Teachers of Family Medicine, Blue Cross and Blue Shield, and American Nurses Association.

IV. ISSUES RELEVANT TO COST ESTIMATES

A number of issues that bear on the true cost of fully insuring preventive services emerged from discussions held with the National Coordinating Committee on Clinical Preventive Services and the Agencies of the U.S. Public Health Service. They are discussed below.

Cost-Sharing and Deductibles. The RAND Health Insurance Experiment found that utilization of preventive services with 20 percent co-insurance was 82 percent of the utilization without cost sharing for young children and 88 percent of the utilization of Pap smears for women aged 17 to 44.² A study of \$5 co-payments for preventive visits in a health maintenance organization (HMO) showed a 14 percent decrease in physical examinations but no significant effect on childhood immunizations or cancer screening tests on women.⁷⁴

The premiums reported here for the addition of preventive services assume *no* cost sharing or deductibles for patients. Medicare does not charge beneficiaries the usual 20 percent co-insurance on laboratory tests and exempts pneumococcal vaccines from deductibles and co-insurance. Some State mandates exempt preventive services from cost sharing. The evidence suggests that requirements for co-insurance will decrease utilization of services by approximately 15 percent in the general population, with a somewhat greater effect on lower socioeconomic status groups. Premium costs in the short run would be lessened by making use of co-insurance, but total expenses could increase if missed preventive services result in higher costs later.

Other Care Deliverers/Other Settings.

Alternate delivery systems have the potential to lower the costs of delivering clinical preventive services. Provision of preventive services in school, worksite, health department, and other community settings can decrease the cost of the delivery of packages at the same time that it increases their accessibility.

Uninsured and vulnerable populations who are poorly integrated into health care systems may require additional outreach programs to enhance their access to these services. Programs undertaken for these populations are not anticipated to lower the costs of the packages. The use of alternate delivery sites requires careful coordination with other health care systems to ensure that clinical preventive services are imbedded within the continuum of medical care.

Systems Efficiencies and Economies of Scale. Administrative cost savings can be anticipated with the packaging of clinical preventive services. Less administrative work will be needed to reimburse grouped services than would be required for delivery of the services individually, providing efficiencies in traditional insurance payment mechanisms. Additionally, administrative costs are likely to decrease with health care reform. For example, with the growth of HMOs and capitated payments, paperwork associated with claims for preventive packages would be expected to virtually disappear.

For certain clinical preventive services, economies of scale can be predicted as system capacities are used more efficiently. For example, the capacity of U.S. mammography equipment was projected in 1991 to be greater than three times the amount of current usage and well beyond what would be required if women were to respond to National Cancer Institute recommendations. Excess capacity was estimated to contribute to a 100 percent increase in cost per individual examination.⁷⁵ As the utilization of clinical preventive services increases in the population, economies of scale in laboratory-related services can be anticipated.

Primary Care Health Professional

Shortages. The United States lacks adequate number of primary care providers. Generalists have decreased in number significantly over the past two decades. In 1965, 45 percent of all

private practitioners were in general practice.⁷⁶ In 1992, family physicians and general practitioners composed 11.4 percent of all physicians, and 39 percent overall were care specialties, including family and general practice, pediatrics, internal medicine, and obstetrics/gynecology.⁷⁷

Currently there are 23,659 practicing nurse practitioners (NPs)⁷⁸ and 21,633 physician assistants (PAs).⁷⁹ The demand for NPs and PAs is greater than the supply, as demonstrated by widespread vacancies in positions.⁸⁰ An Office of Technology Assessment study concluded that the care given by NPs, PAs, and certified nurse midwives in prevention compares favorably with that given by physicians.⁸¹

To the extent that the full complement of preventive services is not within the scope of traditional practice because of a lack of training or skills in a particular area of the periodic health examination, efforts to re-train practicing physicians will be important. Broadened training of some primary care professionals and an overall increase in the number of persons entering primary care will be required to guarantee adequate personnel to furnish these services in a cost-efficient manner.

Delivery of Services in Packages. The bundling of services assumes both an adequate number of primary care health professionals available to deliver comprehensive preventive care, as well as provider compliance in providing the full array of services. Economies in service delivery are captured only if the entire package is delivered during a single visit.

Recent work suggests that physicians do not deliver preventive services in a packaged form. An analysis of data from the 1989/90 National Ambulatory Medical Care Survey reviewed bundling of Pap smears and breast cancer screening with other preventive services in women aged 45 and older. Subspecialty internists, obstetricians/gynecologists, family and general practitioners, and general internists bundled five or more preventive services in 13 percent, 21 percent, 25 percent, and 31 percent of visits, respectively.⁸²

Effect of Increased Reimbursement for Cognitive Services. Disparities in reimbursement for cognitive versus procedure-oriented visits

historically have disfavored primary care providers. In an effort to increase incentives for primary care clinicians, Medicare's Resource-Based Relative Value Scale, implemented in 1992, was designed to increase gradually payment for the cognitive work that predominates in much of primary care and decrease reimbursement for the procedures generally performed by specialists. While primary care providers were expected to see a rise in reimbursement by approximately 30 percent over a 5-year phase-in,^{83,84} recent work⁸⁵ suggests that current mechanisms for allocating practice costs result in significantly lower payments to primary care providers than was originally envisioned under physician payment reform. To the extent that health care reform will revise fee structures to reimburse more generously nonprocedural medical care, a proportionate increase in the cost of the outlined packages will be seen.

Induced Costs of Insuring Clinical Preventive Services. The costs of the packages do not include information about additional induced costs that will stem from positive screening tests and unanticipated clinical consequences of other preventive interventions. For example, abnormal Pap smears generate repeat Pap smears and colposcopy, abnormal mammograms generate breast biopsies, elevated cholesterol levels generate repeat tests, and immunizations can generate undesired side-effects.

In screening, the identification of a true positive—where a patient is identified as having an abnormality that further testing confirms—creates neither financial nor medical dilemmas from a policy perspective. The false identification of an abnormality leading to further testing and expense, as well as possible untoward medical outcomes, is more problematic. Screening tests covered under a core benefit package should discriminate with reasonable accuracy between the true presence and true absence of a pathologic condition, and the tests generated when a possible abnormality is discovered should have an acceptable level of risk and cost associated with them. The U.S. Preventive Services Task Force considered these issues in making its recommendations and chose not to include those interventions for which potential adverse effects were of significant clinical concern or which could

TABLE 9
Targeted Tests for High-Risk Populations

Test or Immunization	High-Risk Group
Hemoglobin electrophoresis	Newborns of Caribbean, Latin American, Asian, Mediterranean, or African descent.
Tuberculin skin test	Household members of persons with tuberculosis or others at risk for close contact with the disease; recent immigrants or refugees from countries in which tuberculosis is common (e.g., Asia, Africa, Central and South America, Pacific Islands); family members of migrant workers; residents of homeless shelters; or persons with certain underlying medical disorders.
Rubella antibodies	Females of childbearing age lacking evidence of immunity.
Hearing test	Persons exposed regularly to excessive noise in recreational or other settings.
Pneumococcal vaccine (<65)	Persons with medical conditions that increase the risk of pneumococcal infection (e.g., chronic cardiac or pulmonary disease, sickle-cell disease, nephrotic syndrome, Hodgkin's disease, asplenia, diabetes mellitus, alcoholism, cirrhosis, multiple myeloma, renal disease, or conditions associated with immunosuppression).
Influenza vaccine (<65)	Residents of chronic care facilities or persons suffering from chronic cardiopulmonary disorders, metabolic disease (including diabetes mellitus), hemoglobinopathies, immunosuppression, or renal dysfunction.
Mammograms	Women aged 35 and older with a family history of premenopausally diagnosed breast cancer in a first-degree relative.
Colonoscopy	Persons with a history of familial polyposis coli or cancer family syndrome.

generate large increases in health care expenditures when performed on a large segment of the population.

There are no available estimates of the amount of induced costs that will flow from universal coverage of the screening tests and other preventive services outlined in this report. Uptake of services will increase for persons previously uninsured and will cause further clinical investigation in instances where screening tests have erroneously identified abnormalities. However, in many instances, wider screening will result in the identification of illnesses early in their course, when simpler and less expensive therapies will suffice.

Type and Periodicity of Tests. For some populations, the circumscribed set of services covered by a packaged approach will result in a decrease in the frequency of use of certain services (e.g., Pap smears, mammograms,

cholesterol screening) and an end to the use of others (e.g., routine blood chemistries, chest x-rays). Significant savings should accrue from the combined effects of decreasing the periodicity of administration of certain screening tests and the avoidance of others altogether.

In other groups at high risk for illnesses described in this report (e.g., breast and cervical cancer), appropriate preventive care may require decreased time intervals or earlier start of screenings. For other illnesses and conditions (e.g., HIV testing and screening for sickle-cell disease), additional tests may be required. Table 9 lists effective preventive services appropriate to persons with risk factors for particular illnesses and conditions. The lack of adequate data on the number of persons at high risk for a number of these conditions precludes the inclusion of projections of their costs in the premium estimates provided here.

APPENDIX

MEMBER ORGANIZATIONS OF THE NATIONAL COORDINATING COMMITTEE ON CLINICAL PREVENTIVE SERVICES

Ambulatory Pediatrics Association
American Academy of Family Physicians
American Academy of Pediatrics
American Academy of Physician Assistants
American Association of Colleges
of Nursing
American College of Obstetricians
and Gynecologists
American College of Physicians
American College of Preventive Medicine
American Hospital Association
American Medical Association
American Nurses Association
American Osteopathic Association
American Osteopathic College of
Preventive Medicine
American Public Health Association
Association of Academic Health Centers
Association of American Medical Colleges
Association of Health Services Research

Association of Schools of Public Health
Association of State and Territorial
Health Officials
Association of Teachers of Preventive
Medicine
Blue Cross and Blue Shield Association
Group Health Association of America
Health Insurance Association of America
Institute of Medicine
National Alliance of Nurse Practitioners
National Association of Community
Health Centers
National Association of County
Health Officials
North American Primary Care
Research Group
Society of General Internal Medicine
Society for Public Health Education
Society of Teachers of Family Medicine
U.S. Conference of Local Health Officers

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